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THE INFLUENCE OF INTELLIGENCE UPON CHILDREN'S READING INTERESTS

By
MIRIAM BLANTON HUBER, Ph.D.

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M. B. H.

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THE INFLUENCE OF INTELLIGENCE UPON CHILDREN'S READING INTERESTS

CHAPTER I

THE PROBLEM

Within recent years psychologists have devised very expert means of identifying pupils of poor, average, and superior intelligence. Their researches offer accurate information, also, as to the educative possibilities of children at different levels of intelligence. School administrators in large numbers have become convinced of the desirability of organizing classes in such a way that dull, average, and bright children are taught in groups of their own kind. In the majority of school systems in the United States some effort is being made to classify pupils in homogeneous groups, and in many cases such classification is based upon a thorough program of mental testing. With a knowledge of each pupil's ability and an organization designed to facilitate learning, it is necessary that attention be drawn to teaching procedures that may be expected to take advantage of these developments.

Many sincere attempts have been made to fit methods and materials of instruction to the needs of pupils of different levels of intelligence. It has been advocated that dull, average, and bright children not only need to be permitted different rates of advancement in learning, but that they also need different situations and particular adaptations of subject matter. It has been said that curricula in general use have been made for children of average or normal intelligence, that dull children, handicapped by their native incapacity, are, by the nature of things, discriminated against, and that bright children develop undesirable attitudes through lack of incentive and employment of their abilities. Such considerations as these have brought about discussion among educators of differentiated courses of study for pupils capable of different degrees of achievement.

A number of examples have been reported of specific situations

in which particular units of subject matter have been organized and used successfully with certain ability groups. These appear to have resulted from the originality and resourcefulness of the teachers who devised them rather than from any guiding principle or formulated plan applicable to the question as a whole. The need of some basis upon which to determine curricula for children of widely differing intelligence was the incentive of the present study.

Since reading is the most important subject in the elementary school, it seemed desirable to consider differentiated curricula in reading for dull, average, and bright children. For dull and average pupils the teaching of reading is a vital educational question, for through it they are helped to master a skill upon which school progress largely depends. At the same time, through the use of reading, they may satisfy their interests and develop those qualities of appreciation deemed socially desirable. The latter objective is equally applicable to superior children, for whom the mastery of reading skill may be easy. Dull children, on the other hand, it will be agreed, are in need of any help that will enable them to use as effectively and economically as possible the ability that they possess.

It seems justifiable that research be directed toward acquiring more precise information upon which to formulate courses of study in reading that make recognition of the different abilities of the children to be taught. Before it can seem fruitful to discuss the advisability of varying methods, more needs to be known about the content of such differentiated courses. Do dull and superior children wish to read about the same things? Are the interests in reading materials of children of average intelligence similar or markedly dissimilar to those of greater and less intelligence?

The content of courses of study in reading not only is of importance in teaching children how to read, but continues to be of importance after the skill is mastered. What do children want to read when they read for enjoyment and pleasure? Are the subjects chosen by bright children peculiar to them? Do the preferences in reading material of dull children differ from those of children more fortunately endowed in intelligence?

To find an answer to these questions the writer undertook to present a number of selections of children's literature representing

a range of interests to groups of children at different levels of intelligence under experimental conditions and to make comparisons of their reactions and preferences. The means of procedure and the results constitute this study.

CHAPTER II

AVAILABLE DATA

Scientific data relating to the reactions of children of poor, average, and superior intelligence to reading content are limited. In fact, the entire question of content has received much less attention than other problems in reading. W. S. Gray, in commenting on this point, says: [1]

"During a period in which the curriculum is undergoing radical reorganization, it would be natural to assume that the nature and content of the materials of reading instruction should be carefully investigated. A survey of the literature, however, reveals the fact that a relatively small number of investigations have been made in this field as compared with the number of studies of the processes involved in reading."

In considering the relation of intelligence and reading interests, the question arises as to the minimum intelligence requisite for learning to read. Just what this is has not been disclosed with certainty. Gates [2] concludes from the findings of Tredgold and Terman that individuals with I.Q.'s of 50 to 70 can, as the result of training, learn to read books of very simple material. Hollingworth [3] suggests that the general intelligence of a mental age of six years may be capable of learning to read. From the position of Hollingworth,[4] that children of poor and of superior intelligence differ "not in kind, but in degree only," it may be postulated that the reading interests of normal and bright children as revealed by experiment are relevant in a discussion that involves the tastes and preferences of dull as well as of more intelligent children.

From the Stanford research on gifted children in California,

[1] Gray, W. S. *Summary of Investigations Relating to Reading*, p. 175. University of Chicago, 1925.

[2] Gates, A. I. *The Psychology of Reading and Spelling*, p. 18. Teachers College Bureau of Publications, 1922.

[3] Hollingworth, Leta S. *Special Talents and Defects*, p. 58. Macmillan, 1923.

[4] Hollingworth, Leta S. *The Psychology of Subnormal Children*, p. 90. Macmillan, 1920.

Terman[5] reports on the reading of 1,000 children of I.Q.'s of 135 and higher compared with 1,000 unselected children, the ages ranging from six to fifteen years. The types of material standing highest in the regard of both the gifted boys and the boys of the control group were adventure and informational fiction, but the reading of the gifted boys showed a much larger proportion of books of science, history, and biography than did that of the boys of the control group. The books best liked by both the gifted girls and the girls of the control group were stories of home and school life and of adventure, but the girls of the control group showed a greater liking for emotional fiction than the gifted girls. The children of all four groups showed an interest in fairy tales and animal stories.

In experimentation with gifted children in Detroit,[6] in 1920, a comparison of the reading preferences of advanced classes was made with those of normal pupils in the seventh and eighth grades. Pupils were asked to name their favorite book, and their replies were classified by the teachers conducting the investigation as (1) inferior books, which included dime novels and sentimental stories of the Pollyanna type; (2) average books, which included ordinary modern novels and books read for information; (3) superior books, which included the finest fiction and poetry and well written history. The distribution of pupils' reading by these classifications was as follows:

	Special Group	Control Group
Inferior	10	49
Average	54	55
Superior	9	49

In 1919 and 1920, Coy[7] made a detailed study of a class of gifted children of I.Q.'s ranging from 100 to 156, with a mean I.Q. of 128. Their reading interests were compared with those of a control group of children of I.Q.'s ranging from 72 to 116, with a mean I.Q. of 96. She states:[8]

[5] Terman, L. S. and Lima, Margaret. *Children's Reading*, pp. 51 f. Appleton, 1925.

[6] Cleveland, Elizabeth. "Some Further Studies of Gifted Children." *Journal of Educational Research*, 4 : 1921, pp. 195-199.

[7] Coy, Genevieve L. *The Interests, Abilities, and Achievements of a Special Class for Gifted Children.* Teachers College Bureau of Publications, 1923.

[8] Coy, Genevieve L. *Op. cit.*, p. 153.

"The Special boys are markedly higher in instructive books, and somewhat higher in literary books and books in series; the Control boys are slightly higher in adventure and children's books. The Special girls show greater liking for adventure and sentimental tales than the Control girls, while the latter list more books in series and more books about children. In literary value of the books preferred the two groups are practically equal."

At Public School 165, New York City, an experiment was conducted in 1922 and 1923 to learn how young, gifted children respond to the study of biography.[9] A group of twenty-six children of I.Q.'s higher than 150, between the ages of eight and ten years, with a median mental age of fifteen years, was given an opportunity to study the lives of famous people. Their interest was so great that they continued the study of biography, on their own initiative, for two school years after the time originally intended to be given to it, and extended their list of interesting people until it represented almost every form of intellectual endeavor.

The question of providing instruction for children of different levels of intelligence has also been attacked by administrators and teachers in different parts of the United States and from their practical experience have come suggestions of significance that are relevant to this study. Reports from Oakland and from Detroit are examples. Dickson[10] writing in the *Second Yearbook* of the Department of Superintendence of the National Education Association states that the first provision for pupils of different levels of ability in Oakland was an attempt to construct courses of study of different content. Then for a time a plan was tried of having limited classes (dull) follow the same course of study as regular classes but one or two years behind the regular classes. This, however, was regarded as very unsatisfactory and was abandoned for a curriculum adjustment in which the work of the limited classes was based upon content similar to and parallel with that in the regular grades of the same designation but simplified as far as teachers were able to do so.

In Detroit in 1926, five hundred teachers, chosen by their prin-

[9] Hollingworth, Leta S. *Gifted Children*, pp. 320 f. Macmillan, 1926.

[10] Dickson, Virgil E. "Differentiation of Courses to Meet Needs of Pupils of Different Levels of Ability." *Second Yearbook*, Department of Superintendence, N.E.A. February, 1924, pp. 201-206.

cipals for success in teaching bright pupils and dull pupils, were asked to coöperate upon a report of the mental differences of bright and dull pupils and the necessary adjustment in teaching procedures. Baker organized their opinions into a significant analysis. He states: [11]

"In dealing with mental differences from this point of view, we find that a low I.Q. signifies a pupil who must have material presented in short and simple units, with immediate ends, whereas a high I.Q. signifies the need of large units of a comprehensive nature, which have very ulterior ends. The low I.Q. denotes work of concrete nature, whereas the high I.Q. denotes work of an abstract, generalized, and complicated nature. . . . The low I.Q. often signifies a narrow and individualistic point of view, whereas the high I.Q. usually symbolizes a thoroughly social point of view and a power for coöperation in civic enterprises. . . . The average child probably strikes a medium between the marked differences that have been noted in bright pupils and dull pupils."

The dull pupils in this school system are explained to be those of I.Q.'s ranging from 70 to 90 and the bright pupils, of I.Q.'s ranging from 110 to 130.

Several investigations, of immediate bearing upon the present study, have been made of children's interests in reading, in which no differentiation of the tastes of children on the basis of intelligence was made. It may be assumed that the results were a composite of the school population examined. In 1921, Dunn [12] conducted an experiment in which thirty-one samples of reading material were read to 195 classes of Grades I, II, and III in New York City, and in towns in Virginia, Arkansas, Missouri, and California. The children's preferences were interpreted in the light of analyses of the elements of interest in the selections made by adult judges. The characteristics which caused the greatest interest were surprise and plot for both boys and girls, animalness for boys, and childness (presence of child characters in the story) and familiar experience for girls. The sex differences, however, were small.

[11] Baker, H. J. *Characteristic Differences in Bright and Dull Pupils*, p. 4. Public School Publishing Company, 1927.

[12] Dunn, Fannie W. *Interest Factors in Primary Reading Materials*. Teachers College Bureau of Publications, 1921.

In the same year, Jordan [13] reported an investigation of children's reading based upon library withdrawals and upon questionnaires to children. The books taken by children from six New York City libraries and two libraries in near-by cities, the answers to questions from 3,598 pupils in Arkansas, Kansas, and Washington, D. C., were analyzed to determine the elements of interest which influence children's choice of reading material. In 1925, Jordan gave the same questionnaire to pupils in the schools of Charlotte and Greensboro, North Carolina. He found a striking similarity in the returns of the two investigations. His findings show the strongest reading interest of boys to be adventure, of girls, fiction. Humor, in the Greensboro investigation, is shown to have an appeal for boys. Boys and girls both fail to choose to any great extent books on science, information, travel, biography, and history.

Data as to choices of materials of reading liked best by six hundred children in Grades I, II, and III in different parts of the United States were obtained by Grant and White.[14] The total first and second choices in types of material were found by them to rank as follows: animal, fairy, folk lore, poetry, informational, historical, children's experience.

A study of children's interests in poetry was made during the year 1925-1926 by Huber, Bruner, and Curry,[15] who secured the coöperation of 50,000 pupils and 1,500 teachers in determining the verse most suitable for pupils in Grades I to IX. Their experimental material was made from an analysis of present practice and opinion and subjected to experimentation with children in different sections of the country. Their findings show a variety of interests in each grade. The greatest interests appear to be: in Grade I, animals and play; in Grade II, lullabies; in Grade III, outdoors and fairies; in Grade IV, humor and nonsense; in Grade V, heroes; in Grade VI, home and danger; in Grade VII, satire and romance; in Grade VIII, romance and tragedy; in Grade IX, social relationships and conduct.

[13] Jordan, A. M. *Children's Interests in Reading.* Teachers College Bureau of Publications, 1921. A revision and extension of the study published by the University of North Carolina Press, 1926.

[14] Grant, Emma B. and White, Margaret L. "A Study of Children's Choices of Reading Materials." *Teachers College Record,* Vol. XXVI, April, 1925, pp. 20-27.

[15] Huber, Miriam B., Bruner, H. B., and Curry, C. M. *Children's Interests in Poetry.* Rand McNally, 1927.

Data available as bases for this study may be summarized as follows:

1. Very dull children may be taught to read.
2. Studies of gifted children do not show their tastes in reading to be greatly different from those of children of less intelligence, but their reading, on the whole, is of better quality.
3. Certain school systems where the matter has been studied report a lack of success in using courses of study differentiated in content for different levels of intelligence.
4. Studies of the reading interests of children of average intelligence show that elements high in their preferences are: surprise, plot, action, animals, play, fancy, and adventure.

CHAPTER III

SELECTION OF MATERIAL FOR EXPERIMENTATION

Reading, as taught in the elementary schools, is expected to give the child an instrument for use in practically all his other activities, but, in addition, the intrinsic merit of what he reads is believed to be of sufficient consequence to demand attention by course of study makers. Several studies, to which reference has been made in Chapter II, offer objective evidence upon which to select the content of reading materials for children. In attempting to compare the reading interests of children of different levels of intelligence, previous studies of children's interests have been accepted as guides in selection of material. Further search was made in children's literature for selections embodying attitudes considered socially desirable.

For convenience in handling the experiment, six types of literature for children, with five selections of each type, were decided upon. The requirements of the experiment itself placed a limitation upon the length of the selections. It was necessary that each one be of such length that any two of them paired together might be read aloud in twenty-five minutes or less.

Each type of material with its definition and the selections chosen as representative of that type is given in the following:

Type A. Familiar Experience: Family life and intimate social relationships; things that have happened to the child or may be certain to do so in the natural course of living.

1. "Only One Mother," George Cooper
2. "Mother Moon," Amelia Josephine Burr
3. "How the Home Was Built," Maud Lindsay
4. "A Boy's Mother," James Whitcomb Riley
5. "Somebody's Mother," Author Unknown

Type B. Unusual Experience: Adventure; the "thriller"; the thing that does not happen to the ordinary person every day; stirring happenings—but realistic, not fanciful.

1. "Don, a Collie Dog," Miriam Blanton Huber
2. "Davy Crockett and the Bears," John W. Wayland
3. "The Magic Forest," Stewart Edward White
4. "The Bears of Blue River," Charles Major
5. "Jock, a Good Dog," Lillian Gask

Type C. Humor: Grotesque, "tumble down" elements of humor; humor of plot and incident; sophisticated nonsense.

1. "Frogs at School," George Cooper
2. "The Baby Elephant and the Red Cap," Miriam Blanton Huber
3. "The Tar Baby," adapted from Joel Chandler Harris
4. "The Elephant's Child," Rudyard Kipling
5. "The Walrus and the Carpenter," Lewis Carroll

Type D. Fancy: The unreal; the supernatural; delicate symbolism.

1. "The Gingerbread Boy," adapted from an old folk tale
2. "A Visit from St. Nicholas," Clement C. Moore
3. "The Tinder Box," Hans Christian Andersen
4. "A Story of the Springtime," adapted from a Greek myth
5. "The Selfish Giant," Oscar Wilde

Type E. Information: Industrial processes; sources of materials; information of geography, science, and nature.

1. "The Little Gray Pony," Maud Lindsay
2. "The Eskimo," Miriam Blanton Huber
3. "Iron," John W. Wayland
4. "Corn," John W. Wayland
5. "Health," Bulletin of the Horace Mann School

Type F. Heroism and Service: Heroes and patriots; civic responsibilities; service to larger groups than the family; history; biography.

1. "Balto, an Eskimo Dog," Miriam Blanton Huber
2. "Finding a New World," John W. Wayland
3. "Joan of Arc," John W. Wayland
4. "The Leak in the Dike," adapted into prose from Phoebe Cary

5. "Richard Kirkland: A Story of the Civil War," Clara B. Baker [1]

It was desired that an objective measure of the quality of these selections be obtained. Accordingly, seven competent persons were asked to rate the material. These judges were members of a graduate class in Children's Literature of Teachers College and were experienced teachers of the subject. A complete copy of the material was given to each judge but the names of the authors and the sources of each selection had been removed. They were asked to make no effort to locate the sources, but, of course, many of the selections were recognized by persons of the degree of familiarity with the subject which these individuals had.

They were asked to give two series of ratings of the quality of the content and to give, also, a rating of the range of interests covered by the material. The following directions were issued:

DIRECTIONS

You are asked to rate thirty selections from literature for children which have been used in an experiment to determine the influence of intelligence upon children's reading interests.

For convenience it was decided to use six types of material and five selections of each type. This body of material, thirty selections in all, is in your hands. Will you give your opinion as to the merit of these selections?

Each type of material is defined and the selections of that type listed. Please read the selections with the following questions in mind:

I. How well does this selection represent the type of children's literature under which it is listed?

II. How well does this selection represent the entire field of literature for children?

To answer the first question compare the selection with the *best of this type* that you know in the field of children's literature. If, in your judgment, it is as good as the *best,* give it a rating of 20. If it is as good as the *average,* rate it as 10. If it is extremely *poor,* rate it as 0.

To answer the second question, consider the selection independently of the type under which it is placed and compare it with the *best of all literature for children,* regardless of subject or theme. If, in your opinion, it is as good as the *best,* give it a rating of 20. If it is as good as the *average,* rate it as 10. If it is extremely *poor,* rate it as 0.

You are asked to give little attention to the difficulty of the selection, as that is being rated separately, but to consider in answering Question I,

[1] A complete copy of this material with acknowledgment of sources may be found in the Library of Teachers College, Columbia University.

its literary merit, its content, and its suitability for the type under which it is placed, and in answering Question II to judge the literary merit and content of the selection as compared with the entire field of literature available for children. In each case you are asked to give your judgment of each selection by a figure ranging from 0 to 20.

In addition to the information given above, will you please state your opinion of the types of material used? Do these types represent the range of subjects covered in children's literature? Please state your judgment in the form of rating on a scale of 20. If you think this material is *excellently* representative of the range of interests found in children's literature, rate it as 20; if *average*, rate it as 10; if *poor*, less; or such intervening rating as you think accurate.

It was thought necessary, also, to obtain ratings of the difficulty of the selections used in experimentation. The persons who conducted the experiment, to be described in Chapter V, were asked to rank them in order of difficulty. It was thought that their experience in reading the material aloud would aid in judging difficulty, while for judgment of quality it was desired to have the opinions of persons who had no knowledge of the children's reactions to the selections.

The directions for ranking the material for difficulty were as follows:

DIRECTIONS

Will you please arrange the thirty selections in an order from the least to the most difficult for the pupil to understand?

It may be assumed that the following factors, and probably others as well, contribute to difficulty:

1. Words: abstractness, unusualness, technicalities, unfamiliarity, etc.
2. Sentence structure: complexity, length, unusualness, confusion, etc.
3. Paragraph structure: complexity, length, lack of unity, etc.
4. Ideas: abstractness, unfamiliarity, complexity, subtlety, etc.
5. Composition as a whole: length, abstruseness, subtlety, "adultishness," complexity, lack of continuity, etc.

Consider these and other possible elements which may make a selection difficult. Then arrange the 30 selections from the easiest (all things considered) for children, the one most suitable to the youngest children, to the hardest, the one most suitable to the oldest children. Give the easiest the rank of 1 and the hardest the rank of 30. Your rating should be based on difficulty on the whole, or difficulty all things considered, and not on any one or two characteristics.

It was expected that the two ratings of the quality of each selection might not be in agreement, for a selection might be accounted high, when compared to available material of its type,

but be accounted low in quality when compared to the entire field of literature for children.

While the individual ratings of the quality of the selections in each type as compared with other material of the same type varied widely, causing the standard deviations of the distributions to be, therefore, very large, the average judgments for each type were close, as may be seen from Table I.

TABLE I

TEACHERS' RATINGS OF QUALITY OF SELECTIONS COMPARED WITH OTHER CHILDREN'S LITERATURE OF SAME TYPES

TYPE *	AVERAGE RATING	S.D.dist.	S.D.av.
A	16.82	4.12	0.69
B	15.62	5.12	0.87
C	17.71	5.08	0.86
D	16.54	5.49	0.93
E	16.05	5.65	0.95
F	16.42	4.61	0.78

* See pages 10 and 11 for definition of types.

It is apparent from Table I that the average judgment is that the six groups of stories are about equally good representatives of the quality of material available for these types. The greatest difference, that between C and B, is 2.09, which is less than twice the standard deviation of this difference (1.22). All the other differences are less than the standard deviations of those differences.

The judgments of this group of teachers, expert in the subject,

TABLE II

TEACHERS' RATINGS OF QUALITY OF SELECTIONS COMPARED WITH CHILDREN'S LITERATURE IN GENERAL

TYPE *	AVERAGE RATING	S.D.dist.	S.D.av.
A	11.83	6.84	1.16
B	11.85	7.37	1.24
C	17.14	4.66	0.78
D	14.83	5.62	0.95
E	12.31	6.55	1.11
F	14.25	6.46	1.09

* See pages 10 and 11 for definition of types.

as to the absolute merit of these selections, irrespective of the type in which they were placed, show a wide range of opinion upon individual selections. Their average judgments of the types as a whole were, however, as shown in Table II.

An interpretation of Table II seems to indicate that the material placed in Type C is, in absolute terms, graded the best writing—is thought to have those qualities characteristic of the best literature for children. The selections in Types D and F are next and nearly as good in literary merit and in content, but those of A, B, and E, while equal to each other, are clearly considered inferior to those of Type C and probably not as good as those of Types D and F. These differences in quality do not, however, affect the study, as the ratings in Table I show that the selections in each group are equally good when the limitation of the quality of material available on certain of these themes is considered. The opinion of the judges rating the material, who are acquainted with the field of children's literature, appears to be that better stories and poems of the kind designated as Type C have been written, or the subject lends itself to better writing, than those of the kind designated as Types A, B, and E.

In reply to the question as to the completeness and representativeness of the range of children's interests covered by the six types of material chosen, the judges were found to be in somewhat closer agreement, with an average rating of 18.43 and the standard deviation of that average, 0.81.

The judgments showed considerable variation in difficulty among the selections included under each type. For experimental

TABLE III

TEACHERS' RATINGS OF DIFFICULTY OF SELECTIONS

The lowest rating represents the least difficult.

TYPE *	AVERAGE RATING	S.D.dist.	S.D.av.
A	11.6	8.6	1.5
B	17.7	12.3	2.6
C	14.7	10.55	2.11
D	15.4	10.1	2.2
E	15.5	11.3	2.8
F	18.5	14.1	2.8

* See pages 10 and 11 for definition of types.

purposes, these variations were desired. Because of better agreement among the judges as to difficulty, fewer (five) were needed. Their ratings are shown in Table III.

The ratings in Table III differ from those in Tables I and II by being ranks in a range of 1 to 30. The absolute difference between the extremes, Types A and F, is 6.9 with a standard deviation of 3.16, making a ratio of 2, which would seem to indicate that the difference is reliable though it may be very small. The difference between Types F and C is 3.8 with a standard deviation of 3.5, which is unreliable.

The conclusions that may be drawn from these ratings of difficulty are at best doubtful. Much more discriminating analysis of difficulty would be needed to establish the relative simplicity of the selections used in this experiment. It seems reasonable to believe, however, that the material in Type A is probably less complex than that of the other types, and very probably less so than that of Type F. No distinction can be drawn between Types B, C, D, E, and F, except that Type C may be a trifle simpler than Type F.

Attention must be drawn to the fact that these ratings of quality and difficulty must be received with reservations, due to the fallibility of the judgments involved. At present there are no standards or criteria generally acceptable for evaluating such factors. Emphasis must be made, however, upon the point that analysis or evaluation of the experimental material is not the purpose of this study. It is, in fact, quite subordinate to the main issue, which is a comparison of the reactions of children of different levels of intelligence to the same reading materials. As far as possible the selection of material for the purpose was made to conform to the belief of what constitutes good literature for children, to the interests of children as revealed by previous studies, and to recognized objectives in education. The opinions of a group of people of taste and experience seem, on the whole, to confirm it.

CHAPTER IV

SUBJECTS OF THE EXPERIMENT

In the public schools of Yonkers, N. Y., four hundred thirty children in fifteen classes were available for experimentation. They were drawn from five schools, which, it seems reasonable to believe, are typical good public schools. The children came from average American middle class families, with more foreigners probably than all sections of the country would show, but a considerably smaller enrollment of foreigners than would be found in public schools in New York City. In almost all the classes were a few negroes.

Of the fifteen classes, six were classified for instruction as dull, five as average, and four as superior. The dull groups were organized in "special" or ungraded classes, and the average and superior groups were taken from Grades I, II, III, IV, and V. An intelligence rating was secured for each child. These ratings were individual Stanford-Binet I.Q.'s obtained by certified testers furnished in the Yonkers school system, who were either full-time psychologists or specially trained teachers giving part-time to testing.

The experiment was conducted with each class separately in its individual classroom, but for greater accuracy the pupils were re-sorted into three groups before results were tabulated. These groups became as follows:

Group I, called Dull Group.....I.Q., 40-89
Group II, called Average Group.....I.Q., 90-108
Group III, called Bright Group.....I.Q., 109-139

The Total Group, which will be referred to later, comprised all the children of the experiment who were included in the final tabulation.

The final distributions of the Dull, Average, and Bright Groups are shown in Table IV.

TABLE IV

AGE DISTRIBUTIONS, FINAL GROUPS OF DULL, AVERAGE, AND BRIGHT CHILDREN

AGE IN MONTHS	DULL GROUP	AVERAGE GROUP	BRIGHT GROUP
170–179	1	1	0
160–169	3	2	1
150–159	6	7	2
140–149	6	8	3
130–139	9	15	7
120–129	11	23	13
110–119	13	24	14
100–109	17	25	22
90–99	18	25	33
80–89	15	30	24
70–79	9	10	10
Average Age in Months.	113.6	110.4	108.0
Average Age in Years ..	9.36	9.20	9.0
Number of Pupils	107	170	131
Mean I. Q.	74.4	98.5	114.6
Range in I. Q.	40–89	90–108	109–139
Mean Mental Age	6.93	9.06	10.31
Distribution of I. Q.'s...	40—49= 9 50—59=25 60—69=40 70—79=25 80—89= 8 107	90— 94=31 95— 99=61 100—104=56 105—108=22 170	109—113=44 114—118=62 119—123=16 124—128= 3 129—133= 4 134—139= 2 131

It may be noted that in this grouping the following age comparisons exist:

The Dull Group is 0.16 years older than the Average Group.
The Dull Group is 0.36 years older than the Bright Group.
The Average Group is 0.20 years older than the Bright Group.

This arrangement was made arbitrarily to provide three groups approximately equal in *time in school* and to make the Average and Bright Groups approximately equal in *grade status.*

Time in School. The data obtained from the school records as to length of time each child had attended school were incomplete and unreliable. It is safe to assume, however, that age, other things being equal, indicates closely, for children in the

same neighborhood, the length of time in school. A factor to be taken into consideration, however, is the probability that bright children enter school at an earlier age than average or dull children. In fact, evidence obtained by Dr. A. I. Gates concerning New York City school children shows that at the same age bright children have been in school longer than average and dull, and that average children have been in school a length of time about midway between that of bright and dull.

The differences in ages for the three groups of this experiment given above are:

9:00 years for Bright Group of Average I.Q., 114.6
9:20 years for Average Group of Average I.Q., 98.5
9:36 years for Dull Group of Average I.Q., 74.4

Gates estimates that in the light of his data on New York City children that for pupils of the I.Q.'s and average ages of those used in this study, the differences in age will make the three groups about equal in time spent in school.

Grade Status. The children of the Dull Group were not classified by grades, but were organized in "special" classes with "high" and "low" divisions. Those of the Average and Bright Groups were distributed in five grades as shown in Table V.

TABLE V

Distribution of Average and Bright Groups in School Grades

Grade	Average	Bright
I	34	31
II	34	31
III	37	30
IV	38	31
V	20	8
Total	163	131

The total number of the final Average Group was raised from 163 to 170 by the addition of 7 children from the higher I.Q.'s of the original dull classes. This was done to compensate for the larger proportion of "average" children in Grade V and makes roughly an equal number from each grade in the Average and Bright Groups.

To summarize, the groups are comparable:

1. In years in school, that is, in the gross amount of educational exposure.

2. In age—since the variations in age are too small under the conditions to be significant.

3. In grade status—as the Average and Bright Groups are about equal in grade placement, due to the advantage the Average Group has in age.

The one marked variable, then, is intelligence.

CHAPTER V

EXPERIMENTAL PROCEDURES

In November, 1927, twelve of the experimental groups were tested for interest in reading materials. Three additional dull groups were added in February, 1928. The mental ages of the children examined in November were computed from the I.Q.'s to give mental ages existing on January 1 and those examined in February were computed as of February 15. In January, 1928, re-tests of the intelligence of a number of the children in the ungraded classes were made and the records corrected for the variations that resulted.

The thirty selections chosen for experimental material were arranged in pairs for reading aloud to the children. Three programs of paired selections were made and each program was used with five groups. The results from each program were weighted equally and combined, one-third weight being given to each program. The programs giving order of paired readings follow:

PROGRAM I

A—1	B—2	C—3	D—4	E—5	A—2	B—3	C—4	D—5
B—1	C—2	D—3	E—4	F—5	C—1	D—2	F—3	F—4
A—3	B—4	C—5	A—4	B—5	A—5			
D—1	E—2	E—3	E—1	F—2	F—1			

PROGRAM II

B—1	C—2	D—3	E—4	F—5	C—1	D—5	E—3	F—4
A—3	B—4	C—4	D—2	E—2	A—4	B—5	C—5	D—4
D—1	E—5	F—3	E—1	F—2	F—1			
A—5	B—2	C—3	A—1	B—3	A—2			

PROGRAM III

A—5	B—5	C—5	E—4	E—2	A—4	B—4	C—4	F—4
B—1	C—2	D—1	D—4	F—3	C—1	D—2	E—3	D—3
D—5	E—5	F—5	E—1	F—2	F—1			
A—3	B—3	C—3	A—2	B—2	A—1			

It will be observed that the position of the types of material in Program II is the reverse of that of Program I and that Program III is in mixed order. This was done in order to provide greater variety of comparisons and to remove position errors. Reference to pages 10 and 11 will give the selections indicated. The letters denote the type of material and the figures the particular selection under that type. For example, in Program I, C–4, "The Elephant's Child," is matched with F–3, "Joan of Arc"; in Program II it is matched with D–3, "The Tinder Box"; and in Program III with E–3, an informational selection entitled "Iron."

The procedure of having the selections read to the children instead of putting the material in their own hands was determined upon to remove the mechanical difficulties of word and sentence recognition which children must control in reading for themselves. Since the object of the experiment was to compare the interests of children of different levels of intelligence, mechanical difficulties were removed as far as possible.

Seven and a half hours were used for the reading and responses in each of the fifteen classes. Three thirty-minute periods, distributed throughout the day for an entire week, were utilized for the fifteen pairs of readings which were given to each class. Especially competent persons were secured to read the selections to the children. They were women of pleasing personality, skilled in reading aloud. In the dull classes it was arranged to have the same person do all the reading to a group to insure greater ease in conducting the experiment. It was not thought necessary to follow this plan with the other classes as all the comparisons for preferences were made between two selections in a pair, both of which were presented by the same examiner. The periods of reading were welcomed eagerly by the children; their pleasure in the experience on the fifth day was as great as on the first, and they expressed disappointment that it was completed.

The assignment of readings and the necessary arrangements were carefully planned beforehand. Each reader was furnished a complete copy of the material and a detailed schedule of the order of readings, the class, the time, and the place of her assignment. The following directions were followed by each person conducting the experiment:

DIRECTIONS

The examiner is urged to meet children cheerfully and to use any form of greeting that seems natural and does not consume much time. It is desired that the children hear the stories under as pleasant conditions as possible.

Examiner reads to pupils:

Take a piece of paper and a pencil. Write your name at the top of the paper. Now lay your pencils down and I will tell you what we are going to do.

(Examiner makes sure each child has paper and writes name.)

Examiner reads to pupils:

Do you like stories? Do you like some stories better than others?

During this week I shall read stories to you, and I want you to help me find out the stories boys and girls like best. Each time I shall read two stories to you, and, when I have finished both of them, I want you to vote for the one you like better. This will help us find the stories boys and girls like best.

Please listen quietly until each story is finished. Listen even if you have heard the story before, because it may be new to someone in the room, or some of the boys and girls may like to hear it again.

When I have finished reading the two stories you may write on your paper the name of the one you like better. Wait until you have heard both stories and don't tell anyone around you which one you like better. Be sure to keep secret the one you vote for, because we want each child to decide for himself. When I have finished reading I will tell you how to write your votes. If you need help in writing the name of the story, whisper it to your teacher or to me and we will write it for you.

(Examiner writes on the blackboard the title of the first story. Examiner reads story. Examiner writes on board the title of second story. The two titles are placed on different parts of the board. Examiner reads second story.)

Examiner reads to pupils:

Be careful not to tell anyone the story you like better. If you like the first one I read better, write this word ..... on your paper under your name. (Examiner writes plainly the key word under the title of first story.) If you like the last story I read better, write this word ..... on your paper under your name. (Examiner places key word under second title on the board.)

(If children are unable to write, have them whisper their choice to you or to their teacher and record it for them. Urge each child to make a choice for himself.)

When Examiner returns to room, she reads to pupils:

I have two more stories to read to you. I want very much to find out which you like the better of these two stories.

Listen quietly. Listen even if you have heard the story before, because it may be new to someone in the room, or some of the boys and girls may like to hear it again.

Do not tell anyone which story you are going to vote for.

(Examiner collects votes and enters them on record sheets.)

Before a statistical analysis of the returns was made the children were re-sorted into three approximately equal groups as described in Chapter IV. The raw figures showing children's preferences in each pair of readings were computed. A check was made to discover if the position of a selection in a pair operated in choices, but it was evident that hearing a selection last or first had no constant influence. This was further substantiated by the continued preference for certain selections from groups having Program I and also from those having Program II, in which the order was reversed.

The preferences in pairs of readings of each of the three groups, the Dull, Average, and Bright, were totalled for each type of material, namely, Types A, B, C, D, E, and F. These types have been explained in Chapter III. The preferences by types of each group were then combined to show the number of choices of each type as opposed to the choices for all other types, that is, the total number of choices for A were computed against the combined choices for B, C, D, E, and F for the Dull, Average, and Bright Groups. The same computation was made for B versus A, C, D, E, and F; C versus A, B, D, E, and F; D versus A, B, C, E, and F; E versus A, B, C, D, and F; and F versus A, B, C, D, and E. The choices of the three levels of intelligence were handled separately.

The raw figures for the choices of each type of material against the combined choices of all other types were then converted into percentages. Their reliability was determined by use of the formula:

$$\sigma_p = \sqrt{\frac{PQ}{N}}$$

in which σ_p is the standard deviation of a percentage, and P represents the per cent of cases choosing Type A (or B, C, D, E, F), and Q the per cent of cases choosing all other types, i.e., $P + Q = 1.00$.

The differences of the percentages of choices of the Dull, Aver-

age, and Bright Groups for each type of material were computed. Their reliability was determined by the use of the formula [1]:

$$\sigma_{p.\,diff.} = \sqrt{\sigma_{p.1}{}^2 + \sigma_{p.2}{}^2}$$

[1] Further discussion of these formulas may be found in Yule's *Introduction to the Theory of Statistics* and in Kelley's *Statistical Method.*

CHAPTER VI

RESULTS

A comparison of the choices of dull, average, and bright children with each other and with those of all the children involved in the experiment on the basis of percentage of choices for each type of material employed shows a striking similarity in results.

In Table VI is shown the percentage of choices of each group of children and of the total group of all children combined for each of the six types of material, with the reliability of each measure.

In Table VII is shown a comparison of the percentages of choices of each group of children for each type of material, with the reliability of their differences.

TABLE VI

PERCENTAGE OF CHOICES OF DULL, AVERAGE, BRIGHT, AND TOTAL GROUPS FOR TYPES A, B, C, D, E, AND F

TYPE	DULL GROUP		AVERAGE GROUP		BRIGHT GROUP		TOTAL GROUP	
	Per Cent	S.D.$_p$	Per Cent	S.D.$_p$	Per Cent	S.D.$_p$	Per Cent	S.D.$_p$
A	39.3	2.0	28.6	1.5	27.8	1.8	29.1	1.0
B	55.1	2.1	54.2	1.6	53.4	1.9	54.1	1.1
C	49.3	2.0	54.6	1.6	55.1	1.9	54.2	1.1
D	63.2	1.9	65.0	1.5	65.0	1.8	64.8	1.0
E	43.5	2.0	43.1	1.5	45.0	1.9	44.0	1.1
F	52.3	2.1	48.8	1.5	50.0	1.9	49.6	1.1
Average Number of Comparisons	535		850		655		2040	

From these tables it will be seen that the reading interests of children at different levels of intelligence, in so far as they are measured by the materials used in this experiment, are very much the same. There is, however, one striking exception. The

TABLE VII

COMPARISON OF CHOICES OF DULL, AVERAGE, BRIGHT, AND TOTAL GROUPS FOR TYPES A, B, C, D, E, AND F

TYPE	GROUPS	PER CENT	DIFF.	S.D.diff.	RATIO (Diff. ÷ S.D.diff.)
A	Dull–Average	39.3–28.6	10.7	2.5	4.28
	Dull–Bright	39.3–27.8	11.5	2.7	4.26
	Dull–Total	39.3–29.1	10.2	2.2	4.64
	Average–Bright	28.6–27.8	0.8	2.3	0.35
B	Dull–Average	55.1–54.2	0.9	2.8	0.32
	Dull–Bright	55.1–53.4	1.7	2.8	0.61
	Dull–Total	55.1–54.1	1.0	2.4	0.42
	Average–Bright	54.2–53.4	0.8	2.5	0.32
C	Dull–Average	49.3–54.6	5.3	2.6	2.04
	Dull–Bright	49.3–55.1	5.8	2.8	2.07
	Dull–Total	49.3–54.2	4.9	2.3	2.13
	Average–Bright	54.6–55.1	0.5	2.5	0.2
D	Dull–Average	63.2–65.0	1.8	2.4	0.75
	Dull–Bright	63.2–65.0	1.8	2.6	0.69
	Dull–Total	63.2–64.8	1.6	2.1	0.76
	Average–Bright	65.0–65.0	0.0	0.0	0.00
E	Dull–Average	43.5–43.1	0.4	2.5	0.16
	Dull–Bright	43.5–45.0	1.5	2.7	0.56
	Dull–Total	43.5–44.0	0.5	2.3	0.22
	Average–Bright	43.1–45.0	1.9	2.4	0.79
F	Dull–Average	52.3–48.8	3.5	2.6	1.35
	Dull–Bright	52.3–50.0	2.3	2.8	0.83
	Dull–Total	52.3–49.6	2.7	2.4	1.13
	Average–Bright	48.8–50.0	1.2	2.4	0.5

preference of dull children for Type A is so much greater than the preference of either average children or bright children, or of all the children combined, as to make it a real and significant difference. The difference in the percentage of choices of dull children and average children for Type A is 4.28 times the standard deviation of that difference; the difference for dull children and bright children is 4.26 times the standard deviation of the difference; and the difference for dull children and both the other groups combined is 4.64 times the standard deviation of the difference. On the other hand, the difference in the percentage of

choices of average and bright children for Type A is seen to be very small.

If it is conceded that complete reliability is indicated by a ratio of 3, when such a ratio is obtained by dividing the difference of two averages by the standard deviation of that difference, it would seem that ratios of 4.28, 4.26, and 4.64 indicate with practical certainty that dull children prefer the kind of reading material which they were offered in Type A more than do average or bright children.[1]

One other difference in the taste of dull children appears, but the difference is less significant and likely to be less reliable. It will be seen from Table VII that the difference in the percentage of choices of dull children and bright children for Type C is 2.07 times the standard deviation of that difference; and for dull children and both the other groups combined the difference in percentage of choices for Type C is 2.13 times the standard deviation of that difference. While this ratio does not indicate the reliability of the other difference, yet the chances are probably 98 in 100 that the true difference is greater than zero.[2]

While the choices of dull children indicate they like the reading material included under Type A much more than do average and bright children, yet they like it least of all the material presented. In fact the material they like best is the same as that placed highest by average and bright children. Table VIII presents the rank order of preferences of children at different levels of intelligence.

It will be seen from Table VIII that the ranks of the choices of dull, average, and bright children differ only in respect to Type C. In the interests of average and bright children, Type C holds the second place, but for dull children it falls to fourth

[1] Garrett, H. E. *Statistics in Psychology and Education*, page 133.

"It is usually customary to take a $\frac{D}{S.D._{diff.}}$ of 3 as indicative of complete reliability, since -3σ includes practically all of the cases in the 'distribution of differences' below the mean. A $\frac{D}{S.D._{diff.}}$ greater than 3 is to be taken as indicating just so much added reliability."

By the statistical technique termed the "critical ratio," used by Dr. J. R. McGaughy in his *The Fiscal Administration of City School Systems*, a ratio of 3 obtained by dividing the difference of two averages by the P.E. of that difference indicates, as stated by him, "the difference is real and significant and not caused by inaccuracies in reporting or by insufficient sampling."

[2] Garrett, *op. cit.*, p. 134.

TABLE VIII

PERCENTAGES OF CHOICES OF DULL, AVERAGE, BRIGHT, AND TOTAL GROUPS BY RANK

RANK	DULL GROUP		AVERAGE GROUP		BRIGHT GROUP		TOTAL GROUP	
	Type	Per Cent	Type	Per Cent	Type	Per Cent	Type	Per Cent
1	D	63.2	D	65.0	D	65.0	D	64.8
2	B	55.1	C	54.6	C	55.1	C	54.2
3	F	52.3	B	54.2	B	53.4	B	54.1
4	C	49.3	F	48.8	F	50.0	F	49.6
5	E	43.5	E	43.1	E	45.0	E	44.0
6	A	39.3	A	28.6	A	27.8	A	29.1

place. If Type C is removed from the ranking, the order of preferences for all groups is identical.

While the preferences of dull children show two distinct divergencies from those of the other groups, no differences at all are apparent in the percentages of choices for any given kind of material of average children and children of the degree of brightness represented by the subjects of this experiment.

A more minute comparison of the distribution of choices within each group is given in the following tables: Table IX showing a comparison of the choices of the Dull Group; Table X of the Average Group; Table XI of the Bright Group; and Table XII of the Total Group, composed of all children involved in the experiment.

TABLE IX

COMPARISON OF CHOICES OF DULL CHILDREN FOR TYPES A, B, C, D, E, AND F

TYPE		PER CENT	DIFF.	S.D.diff.	RATIO (Diff. ÷ S.D.diff.)
D	D-B	63.2-55.1	8.1	2.8	2.89
	D-F	63.2-52.3	10.9	2.8	3.89
	D-C	63.2-49.3	13.9	2.7	5.15
	D-E	63.2-43.5	19.7	2.7	7.30
	D-A	63.2-39.3	23.9	2.7	8.85
B	B-F	55.1-52.3	2.8	3.0	0.93
	B-C	55.1-49.3	5.8	2.9	2.00
	B-E	55.1-43.5	11.6	2.9	4.00
	B-A	55.1-39.3	15.8	2.9	5.45
F	F-C	52.3-49.3	3.0	2.9	1.03
	F-E	52.3-43.5	8.8	2.9	3.03
	F-A	52.3-39.3	13.0	2.9	4.48
C	C-E	49.3-43.5	5.8	2.8	2.07
	C-A	49.3-39.3	10.0	2.8	3.57
E	E-A	43.5-39.3	4.2	2.8	1.50

TABLE X

COMPARISON OF CHOICES OF AVERAGE CHILDREN FOR TYPES A, B, C, D, E, AND F

TYPE		PER CENT	DIFF.	S.D.diff.	RATIO (Diff. ÷ S.D.diff.)
D	D-C	65.0-54.6	10.4	2.2	4.73
	D-B	65.0-54.2	10.8	2.2	4.91
	D-F	65.0-48.8	16.2	2.1	7.71
	D-E	65.0-43.1	21.9	2.1	10.43
	D-A	65.0-28.6	36.4	2.1	17.33
C	C-B	54.6-54.2	0.4	2.3	0.17
	C-F	54.6-48.8	5.8	2.2	2.64
	C-E	54.6-43.1	11.5	2.2	5.23
	C-A	54.6-28.6	26.0	2.2	11.82
B	B-F	54.2-48.8	5.4	2.2	2.45
	B-E	54.2-43.1	11.1	2.2	5.05
	B-A	54.2-28.6	25.6	2.2	11.64
F	F-E	48.8-43.1	5.7	2.1	2.71
	F-A	48.8-28.6	20.2	2.1	9.62
E	E-A	43.1-28.6	14.5	2.1	6.90

TABLE XI

COMPARISON OF CHOICES OF BRIGHT CHILDREN FOR TYPES A, B, C, D, E, AND F

TYPE		PER CENT	DIFF.	S.D.diff.	RATIO (Diff. ÷ S.D.diff.)
D	D-C	65.0-55.1	9.9	2.6	3.81
	D-B	65.0-53.4	11.6	2.6	4.46
	D-F	65.0-50.0	15.0	2.6	5.77
	D-E	65.0-45.0	20.0	2.6	7.69
	D-A	65.0-27.8	37.2	2.5	14.88
C	C-B	55.1-53.4	1.7	2.7	0.63
	C-F	55.1-50.0	5.1	2.7	1.89
	C-E	55.1-45.0	10.1	2.7	3.74
	C-A	55.1-27.8	27.3	2.6	10.50
B	B-F	53.4-50.0	3.4	2.7	1.26
	B-E	53.4-45.0	8.4	2.7	3.11
	B-A	53.4-27.8	25.6	2.6	9.85
F	F-E	50.0-45.0	5.0	2.7	1.85
	F-A	50.0-27.8	22.2	2.6	8.54
E	E-A	45.0-27.8	17.2	2.6	6.62

TABLE XII

COMPARISON OF CHOICES OF ALL CHILDREN, DULL, AVERAGE, AND BRIGHT GROUPS COMBINED, FOR TYPES A, B, C, D, E, AND F

TYPE		PER CENT	DIFF.	S.D.diff.	RATIO (Diff. ÷ S.D.diff.)
D	D-C	64.8-54.2	10.6	1.5	7.06
	D-B	64.8-54.1	10.7	1.5	7.13
	D-F	64.8-49.6	15.2	1.5	10.13
	D-E	64.8-44.0	20.8	1.5	13.87
	D-A	64.8-29.1	35.7	1.4	25.50
C	C-B	54.2-54.1	0.1	1.6	0.06
	C-F	54.2-49.6	4.6	1.6	2.88
	C-E	54.2-44.0	10.2	1.6	6.38
	C-A	54.2-29.1	25.1	1.5	16.73
B	B-F	54.1-49.6	4.5	1.6	2.81
	B-E	54.1-44.0	10.1	1.6	6.31
	B-A	54.1-29.1	25.0	1.5	16.67
F	F-E	49.6-44.0	5.6	1.6	3.50
	F-A	49.6-29.1	20.5	1.5	13.67
E	E-A	44.0-29.1	14.9	1.5	9.93

A comparison between the range of choices for material most preferred and least preferred reveals little difference on the part of average and bright children, but shows the range of preference on the part of the dull to be decidedly more restricted. The differences between highest and lowest percentage of choices of each group are as follows:

TABLE XIII

COMPARISON OF RANGE OF CHOICES OF DULL, AVERAGE, AND BRIGHT GROUPS

GROUP	TYPES	PER CENT	RANGE
Dull	D-A	63.2-39.3	23.9
Average	D-A	65.0-28.6	36.4
Bright	D-A	65.0-27.8	37.2

This difference in range between the choices of the dull and those of more intelligent children might be explained on the grounds: (1) the brighter the children the more pronounced their preferences; (2) the brighter the children the greater their capacity to discriminate; (3) the more intelligent the children the less they like the kind of material offered in Type A.

In considering argument (1) stated above, attention should be drawn to the fact that if the choices for Type A are omitted, the range of preferences of the dull for other types of material is very close to that of both the average and the bright. This is substantiated by the following comparison:

TABLE XIV

COMPARISON OF RANGE OF CHOICES OF DULL, AVERAGE, AND BRIGHT CHILDREN WITH TYPE A REMOVED

GROUP	TYPE	PER CENT	DIFF.	S.D.$_{diff.}$	RATIO (Diff. ÷ S.D.$_{diff.}$)
Dull	D-E	63.2-43.5	19.7	2.7	7.29
Average ...	D-E	65.0-43.1	21.9	2.1	10.43
Bright	D-E	65.0-45.0	20.0	2.6	7.69

The argument that the brighter the children the greater their capacity to discriminate, which has been listed as a possible explanation of the condition revealed by this experiment, does not seem acceptable in view of the fact that the dull show a discrimination among the other types of material that closely

parallels the discrimination exhibited by both the average and the bright groups. Furthermore, a comparison of the difference of range of choices of the dull, average, and bright groups when Type A is left out of consideration reveals a close similarity. This is shown in Table XV.

TABLE XV

COMPARISON OF DIFFERENCE OF RANGE OF CHOICES OF DULL, AVERAGE, AND BRIGHT CHILDREN WITH TYPE A REMOVED

GROUPS	RANGE	DIFF	S.D.diff.	RATIO (Diff. ÷ S.D.diff.)
Bright-Dull	20.0-19.7	0.3	3.6	0.08
Average-Dull	21.9-19.7	2.2	3.4	0.65

The most reasonable conclusion to accept, then, in the light of these facts, is that dull children have, in general, just as pronounced preferences as have average and bright children and they also exhibit a capacity to discriminate similar to more intelligent children, that their interest is significantly greater in the kind of reading material offered in Type A, and that more intelligent children have significantly less interest in this kind of material. In seeking an explanation of this condition, shall we conclude, then, that the reason is that the subject matter, the theme, of the selections placed in Type A is intrinsically more interesting to dull children and that the material of Type C is less so,—or are other factors at work to produce this result?

It would seem that the ratings of content and difficulty, even within the limits of reliability which could be secured, might throw some light upon the matter. In Chapter III discussion was given of the ratings of quality and difficulty made by teachers. By taking these ratings in rank order a correlation with the rank order of preferences of dull, average, and bright children was obtained. The method employed was that of rank differences, using the formula:[3]

$$\rho = 1 - \frac{6\Sigma D^2}{N(N^2-1)}$$

[3] A discussion of measuring correlation by the method of rank-differences may be found in Garrett's *Statistics in Psychology and Education*, pages 190-192.

The variables involved were:

1. Average preferences of dull children for each of 6 types.
2. Average preferences of average children for each of 6 types.
3. Average preferences of bright children for each of 6 types.
4. General quality of selections of each of 6 types judged on scale of all children's literature.
5. Simplicity of material, i.e., difficulty scale reversed, for each type.

The rank order coefficients of correlation were transmuted into product-moment coefficients as follows:

r_{14} (dull children's preferences and judged quality) $= 0.40$
r_{24} (average children's preferences and judged quality) $= 0.59$
r_{34} (bright children's preferences and judged quality) $= 0.76$

It is clear that in the case of the selections used, the brighter the pupils, the closer their preferences correspond to experts' judgments of children's literature. This may mean: (1) that judges rate literature more in accord with expressed interests and needs of bright pupils than those of dull; or (2) that the brighter the child, the more the literary merit of material, as distinguished from difficulty and theme, determines his preferences.

The latter explanation seems the more probable, that is, that literary quality in what they read is of more importance to bright children than to dull.

Correlations of children's preferences with simplicity of the material were as follows:

r_{15} (dull children's preferences and judged simplicity) $= 0.47$
r_{25} (average children's preferences and judged simplicity) $= 0.22$
r_{35} (bright children's preferences and judged simplicity) $= 0.08$

It appears that among these selections there was a tendency for the dull to choose the simpler materials, and a slight similar tendency on the part of average children but less so than for the dull; while bright children show no such tendency, as a correlation of 0.08 is really zero.

Although these correlations reveal tendencies, they cannot be accepted as complete explanations. The question remains: Are

quality and difficulty the only determining factors in the differences in preferences of dull children and of average and bright children?

Further study of the preferences shows that the dull prefer the type designated as the "thriller" to that called humor; whereas, for the average they are equal, and the bright reverse the choice. This is true despite the fact that the "thriller" is rated to be more complex than humor. The average rank in difficulty for the "thriller" (Type B) is 17.7, while the average rank for humor (Type C) is 14.7. On the other hand, the bright may prefer humor, not because it is humor, but because it is material better written; for the average rating in quality for humor (Type C) is 17.4, and for the "thriller" (Type B) it is 11.85. Any conclusion from the present data on this point would clearly be unjustified.

The preferences of dull children and those of average children and of children of the degree of intelligence better than average, of which the subjects of this experiment are representative, differ more significantly in regard to the material called "familiar experience" than in any other respect. The percentages of choices for these selections (Type A) were: for the dull, 39.3 per cent; for the average, 28.6 per cent; for the bright, 27.8 per cent. The dull like the stories and poems of familiar experience and home life more than do the average and bright. In difficulty, however, this material (Type A) is rated the easiest; therefore the dull should like it better, as they do. In quality Type A is rated lowest (or, to be more exact, tied with another for lowest place); therefore the bright should like it less, as they do.

While the assumption that the differences in choices for Type A are due to dull children's greater preference for easy material and to bright children's greater preference for good literature seems valid, the question still remains: Does this indicate that dull, average, and bright children are equally influenced by those factors which comprise content, in so far as they are designated by Types A, B, C, D, E, and F?

A final effort was made to test this point by the use of multiple correlation technique.[4] The variables involved were scores for each type of material representing: (1) children's prefer-

[4] A discussion of multiple correlation may be found in Garrett's *Statistics in Psychology and Education*, pp. 223-228.

ence, (2) quality (as judged), and (3) difficulty (as judged). The correlations among the variables and the multiple correlation between preferences and difficulty and quality combined for each group were as follows:

Dull Group	Average Group	Bright Group
$r_{12} = .40$	$r_{12} = .59$	$r_{12} = .76$
$r_{13} = .47$	$r_{13} = .22$	$r_{13} = .08$
$r_{23} = -.04$	$r_{23} = -.04$	$r_{23} = -.04$
$R_{1.23} = .63$	$R_{1(23)} = .64$	$R_{1(23)} = .77$

In no case is the coefficient of multiple correlation of preference and quality and difficulty combined perfect. This indicates that were the selections of Types A, B, C, D, E, and F absolutely equal in quality and difficulty, the children would still not like them equally well. Elements that enter into the content of the selections of these different types, then, influence preference. Furthermore, these elements influence the choices of the dull more than the choices of the bright, as shown by the gaps between perfect correlation and the obtained multiple correlations. Because of the few types (six) and the unreliability, especially of the measures of difficulty and quality which are, after all, fallible judgments, these distinctions can only be urged as hypotheses for later verification.

CHAPTER VII

SUMMARY AND APPLICATION

The procedures and results of this experiment may be summarized as follows:

1. A body of material, consisting of thirty poems and stories, was selected in the light of previous studies of children's interests to contain, among other elements, surprise, plot, fancy, action, animals, play, adventure, heroes, home life, kindliness, service, information, and humor. The selections were classified into six types called: A, Familiar Experience; B, Unusual Experience; C, Humor; D, Fancy; E, Information; F, Heroism and Service.

2. Groups of judges, expert in literature for children, rated the literary quality and the suitability of the selections in each type to be about equal. Their ratings of the absolute, as distinguished from the relative, merit and of the difficulty of the types of material gave the following ranks: for quality, C, D, F, E, B, A; for difficulty, F, B, E, D, C, A. (The highest literary merit and the greatest difficulty have the first ranks.)

3. The subjects of the experiment comprised fifteen classes in five public schools of Yonkers, N. Y. From the results of individual Stanford-Binet Intelligence Tests they were distributed in three groups, equated for time spent in school and grade status, as follows: Dull Group, mean I.Q., 74.4, average age, 9.36 years; Average Group, mean I.Q., 98.5, average age, 9.20 years; Bright Group, mean I.Q., 114.6, average age, 9 years.

4. The thirty selections were arranged in three programs of fifteen pairs each. Seven and a half hours, in three thirty-minute periods each day for a week, were used in reading the paired selections to the children, each child indicating a preference in each pair.

5. The preferences of each of the three groups, Dull, Average, and Bright, were computed as percentages of choices for each type of material. The results showed the interests of the Bright

and Average Groups in the body of material used to be very similar, and the rank of the types in their preference was: D, C, B, F, E, A. The rank of the preference of the Dull was: D, B, F, C, E, A. The greatest difference from statistical treatment of results appeared in the percentage of choices for Type A, in which the difference of the percentages of choices of the Dull and Average Groups was 4.28 times the standard deviation of that difference and the ratio of the Dull and Bright Groups was 4.26. A ratio obtained in the same manner of the preferences of the Dull and Bright Groups for Type C was 2.07. The preference of the Dull for Type C was less than that of the other groups, while for Type A it was greater. Correlation techniques were employed to find the relation between children's preferences and the ratings of quality and difficulty. For the Dull Group the coefficient of multiple correlation of preferences and quality and difficulty combined was .63; for the Average Group, .64; for the Bright Group, .77.

What are the conclusions to be drawn from the facts of this experiment?

With a measure of certainty it may be said:

1. Marked preferences in different kinds of reading material are shown by dull, average, and bright children. They really do discriminate and express consistent preferences.
2. A striking similarity exists in the choices of dull, average, and bright children for types of literature, each type representing equally good selections from the available materials of that type.
3. Dull children like the selections of humor here used less than do the average and the bright, and they like the selections designated as "familiar experience" more than do the children of the higher levels of intelligence represented by the subjects in this experiment.

Less certain conclusions are:

1. The choices of the dull, in this study, are more influenced by the complexity of the material, and the average are less so; while the bright are little concerned with complexity, within the limits of the material here used.
2. The choices of the dull are less influenced by literary qual-

ity; whereas the average prize it more, and the bright children most.

3. The choices of the dull are most influenced by the content or subject of the material, the average less so, and the bright children least.

The conclusions applicable to a practical educational program are, in the main, as follows:

1. Children, at all levels of intelligence, are appreciative of the quality of reading materials. Dull children, as well as those more fortunately endowed in intelligence, appreciate the merit of stories and poems which are offered them.

2. To insure the greatest satisfaction to children in reading, attention should be given to the content and subject matter. Children of dull, average, and superior intelligence have distinct and consistent interests in reading which deserve recognition in curriculum making. This is especially important in the education of dull children, whose interests, on the whole, show a striking similarity to those of more intelligent children.

3. A factor of importance in arranging courses of study in reading is complexity of material. It is necessary that material be graded carefully to the pupils' level of intelligence. Bright children can appreciate material of a wide range of difficulty, but in preparing reading materials for dull children care should be taken to avoid unusual words, confused or involved sentence and paragraph structure, or abstract and subtle ideas.

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